K&F SONA 5

User's Manual

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Important Information, Please Read Before Use!

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1. Introduction

Thank you for your decision to buy a KLING & FREITAG sound system. To guarantee a trouble-free operating of the equipment and to allow your KLING & FREITAG SONA 5 system to achieve its full potential please read the operating instructions carefully before use. With the purchase of a SONA 5 system, you have acquired a large sound system with the highest possible quality and performance capabilities. As the owner of a SONA 5 system, you now have a versatile and highly professional tool which, when operated properly, is a true pleasure to use.

1.1 Symbols in User's Manual

This symbol indicates the possibility of life-threatening danger and a health risk for persons. Not following these instructions may result in serious health problems including potentially fatal injuries.

This symbol indicates a possibly dangerous situation. Not following these instructions may cause minor injuries or cause property damage.

This symbol gives instructions for the proper use of the described products. Not following these instructions may cause malfunctions or property damage.

This symbol indicates notes that help you to handle the described products easier.

1.2 Information about this User's Manual

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All specifications in this manual are based on information available at the time of publishing for the features and safety guidelines of the described products.

Technical specifications, measurements, weights and properties are not guaranteed.

The manufacturer reserves the right to make product alterations within legal provisions as well as changes to improve product quality.

All persons who use the speaker system must have this guide and all further information for safe operations available to them during assembly, disassembly, and use.The speaker system may neither be set up nor used until this manual has been read, understood and kept readily available on site.

We appreciate any input with suggestions and improvements for this manual. Please send this to us at the following address:

info@kling-freitag.de or to:

KLING & FREITAG GMBH Junkersstr.14 D-30179 Hannover.

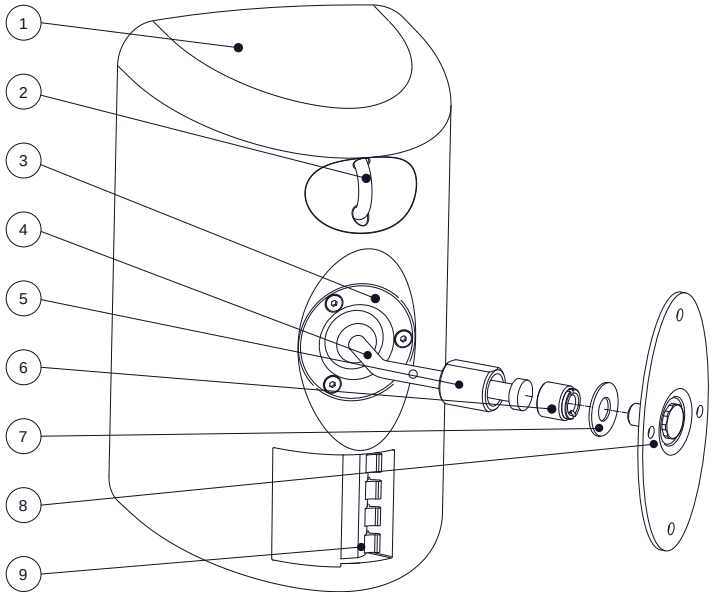
Phone +49 (0) 511 96 99 70, Fax +49 (0) 511 67 37 94.

2. Product Description

2.1 Scope of Delivery

- Loudspeaker with integrated ball joint swivel arm M (56mm) for wall, ceiling or stand mountings
- User's Manual
- Loudspeakers with option 'Phoenix connector' or '100 Volt' are supplied including the corresponding 4-pole Phoenix plug.

2.2 Overview of Components



1. **Loudspeaker enclosure**, hightech moulding material (flame retardant class V0 according to UL94) with textured paint finish
2. **Safety eyelet** for 5 mm quick link (quick link not included but available as accessory)
3. **Clamp collar**
4. **Ball joint swivel arm**
5. **Retainer**, 5/8" inner threading for thread reducer
6. **Thread reducer**, 5/8" on M10
7. **Rubber washer**
8. **Mounting plate** with M10 bolt
9. **Quad push connector**, suitable for wire cross section up to 4mm^2

2.3 Accessories

- 5 mm quick chain link. For use with the safety eyebolt on the speaker.
- Swivel arm S (32 mm)
- Swivel arm L (109 mm)

2.4 Required Tools

- 2.5 mm Allen head wrench
- 19 mm jaw spanner
- Mounting accessories for installation on walls or ceilings

3. Safety Instructions

3.1 Mounting the Speakers / Wall and Ceiling Installation

Warning

The speakers may only be mounted to wall and ceilings by qualified personnel.

The technicians responsible for assembling the speakers on site are responsible for the safe setup and use of the speakers and guarantee this.

Never use signal cables or power cords for suspending, aligning or securing the systems.

Before carrying through ceiling and wall installations, it is essential to consider the load capacity of walls, ceilings and panelling as well as the stability and type of the construction. If there is wall panelling, for example, it is then necessary to examine the solidity of the wall and use the appropriate wall plugs.

Make sure to comply with the stipulated tightening torques.

If not otherwise stated in this manual, only original KLING & FREITAG parts may be used for mounting the speakers. The use of other parts - in particular parts by other manufacturers - is not permitted in this case.

Ensure that all installation connections comply with the applicable safety guidelines and that the size and strength are sufficient.

Ensure that all connections are secured against coming loose and that only authorized, statically tested and correctly sized supports, mounting equipment, wire ropes and chains are used.

As a basic principle, you must visually inspect all components of the speaker before every use. If there are signs of wear, cracks, or deformation, then you must replace the parts immediately. The visual inspection also includes checking the screwed connections on supporting elements.

The information described here does not relieve the user of the duty to follow the given safety requirements and legal regulations.

Fixed installations (stationary):

- For fixed installations without safety, always secure the retainer nut and the M10 thread of the thread reducer to prevent loosening. ou can do so either by using the provided rubber washer or – with longer threads – glue for securing screws.

Mobile installations (non-stationary):

- Always secure the speaker with a second independent safety device to prevent falling.
- To do so, use an approved safety rope with a 5 mm quick link on the safety eyebolt of the speaker enclosure. You can get an appropriate quick link available as an accessory from Kling & Freitag.

3.2 Notes for Mounting the Speakers

Caution

Mount the speakers securely. To avoid injury or damage, always be sure to mount the speakers securely so that they do not fall. Please note that speakers can move as a result of vibrations. To prevent them from falling from their mounted position, they must be secured properly. When laying out the connecting cables, make sure that nobody can trip.

The stability of stacked systems (also valid for the use of stands and distance rods!) is contingent upon the following stability requirement:

Stacked systems may not fall over even if they are inclined by 10° in each direction. If this requirement is not fulfilled, then it is necessary to take steps to achieve compliance. Possible measures include strapping it to an appropriate base structure or fastening it using safety straps.

3.3 Preventing hearing damage

Caution

Avoid beeing too close to operating speakers. This equipment is capable of delivering sound pressure levels in excess of 90 dB/SPL, which may cause permanent hearing damage.

3.4 Protecting the Speakers / Operating Safety

Important

In general, audio signals should not be overdriven. This may be caused by mixing consoles, equalizers, effect equipment, etc. and should be indicated on this equipment. When a power amplifier is overloaded at the output (clipping), then the amplifier should activate a clipping warning signal. Power amplifiers can also be overloaded at the input circuit without the amplifier signalling the clipping, i.e. when there is not sufficient headroom in the input circuit. We, therefore, recommend turning up the power amplifiers all the way and adjusting the level before the power amplifier in order to avoid overloading the input circuit. In any case, the signal must be reduced as soon as it sounds unnaturally distorted.

Operations without CD 44 Controller:

- To protect the speakers from being destroyed and to avoid fire hazard, they should only be operated with professional power amplifiers with a maximum rated output power of 200W@16Ω (equiv. 400W@8Ω / equiv. 800W@4Ω).
- If power amplifiers have power ratings lower than 100W@16Ohm, then it is imperative that the amplifiers have clipping limiters. Alternately, you can also insert a clipping limiter before the amplifier.
- To protect the loudspeaker from mechanical damage when high SPL is required a highpassfilter of 24dB/oct. at 60Hz has to be inserted into the signal chain.

Operations with CD 44 Controller:

- For optimal performance and operating safety of the SONA 5 speakers we recommend using the system controller K&F CD 44.
- When operating the loudspeaker with amplifers without clipping limiter and nominal amplifier power less than 100W@8Ohm requires to set a Limit Reduction of 3dB for the K&F CD 44 controller. You can find more detailed information about this option in the K&F CD 44 hardware manual.
- The destruction of speakers and the risk of fire as a result of a very rare power amplifier or speaker defect may not be avoided by the controller in any case.

For damage caused by

- overloading the speakers
- using power amplifiers with other than the recommended maximum output power

we do not assume warranty and excludes liability for possible consequential damage.

The following signals may damage the speakers:

- clipping power amplifiers
- permanent high-level signals with high frequency and continuous noise from feedback.
- permanently distorted high-level signals.
- noises, which occur when the amplifier is on while equipment is being con-nected, disconnected or switched on.

Do not install devices in any of the following places:

- where the devices are permanently exposed to direct sunlight.
- where the devices are exposed to high moisture or rain.
- where the devices are exposed to strong vibrations and dust.

Avoid damage caused by the speakers' magnetic fields

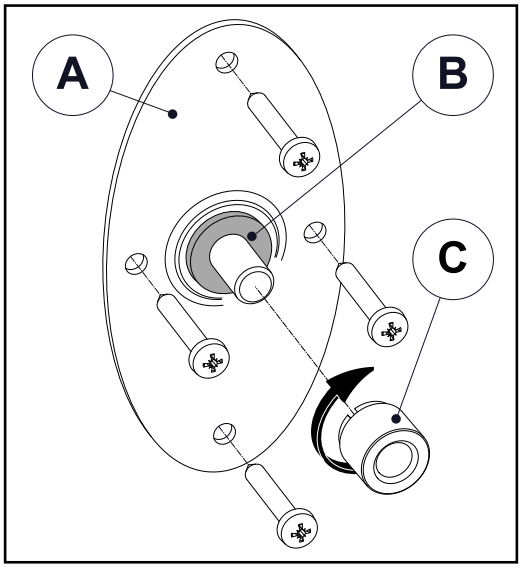
Speakers are permanently surrounded by a magnetic field, even when they are not connected. Therefore, during transport and placement of the speakers, it is important to ensure that there is a sufficient distance between the speakers and magnetic data media and computer/video monitors (except flat panels).

4. Wall and Ceiling Installation

Screw the mounting plate **(A)** through all 4 mounting holes onto the wall or ceiling. Choose fasteners that are suitable for the wall or ceiling material. After installation, the mounting plate incl. speaker must be capable of carrying the 6-fold of its own weight. Take suitable measures to prevent the screw connection from loosening itself.

Ensure that the rubber washer **(B)** is on the bolt.

Screw the thread reducer **(C)** hand tight onto the bolt of the mounting plate. Make sure the slit of the thread reducer is facing the mounting plate. After assembly the M10 bolt has to protrude from the thread reducer.



As an alternative to the mounting plate, you can also mount the swivel arm with other suitable 10 mm bolts.

Warning

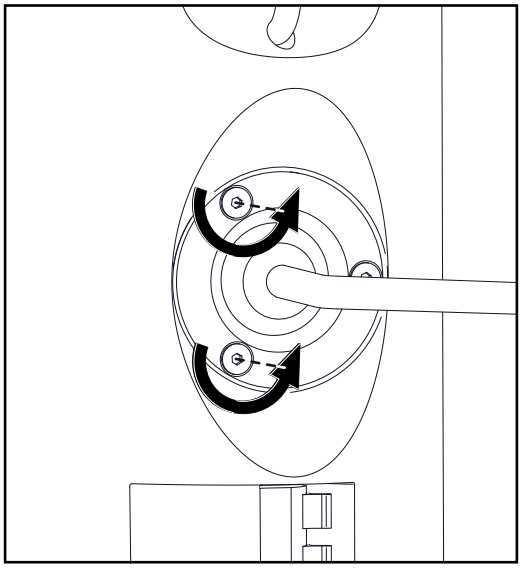
If you screw the swivel arm onto another 10 mm bolt that is longer than that of the wall mount, the rubber safety washer loses its function. In this case, if you were to install the speaker without an additional safety, you would have to secure the thread of the 10 mm bolt and the thread of the connecting nut so they do not loosen themselves (i.e. with glue for securing screws).

Tip

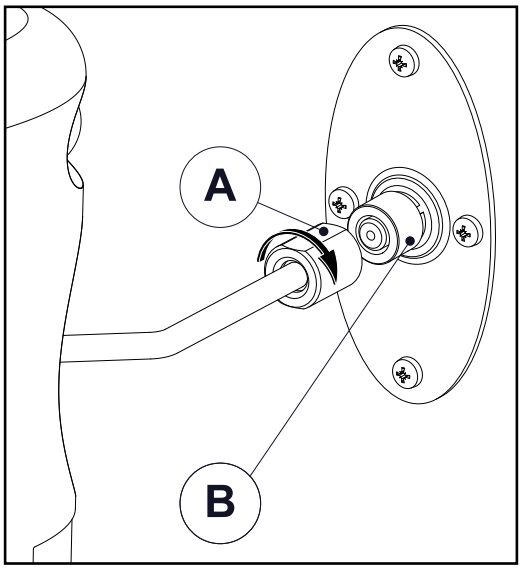
Loosen the Allen screws with a 2.5 mm Allen head wrench.

Loosen one or two of the three Allen screws only. This way you can avoid having to tighten an Allen screw that got covered by the swivel arm while you aligned the speaker.

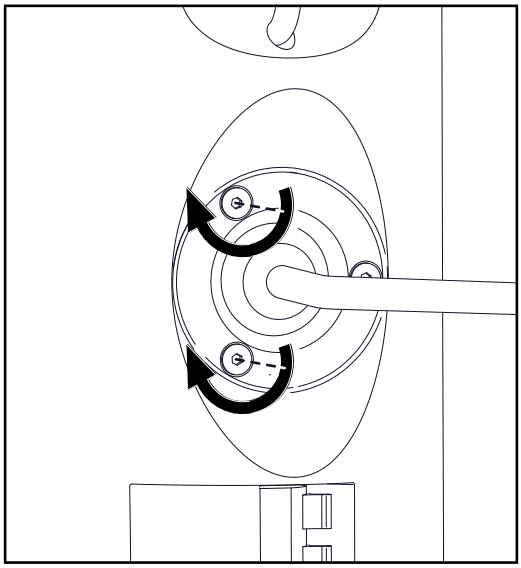
Loosen this screw(s) just enough so that you can move the swivel arm with some resistance. This will simplify the final alignment of the speaker. This will simplify the final alignment of the speaker.



Screw the retainer nut **(A)** onto thread reducer **(B)** using a 19 mm jaw spanner. While doing this, align the swivel arm.



Now align the loudspeaker arm as desired, and then re-tighten the Allen screws that you previously loosened.



Important

Tighten the screws enough so that the speaker reliably keeps its position. Using excessive force to tighten the screws can result in irreparable destruction of the threads!

5. Stand Installation

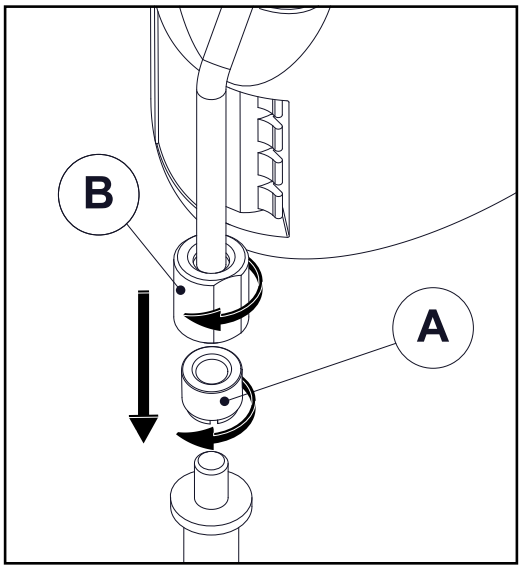
The retainer nut of the swivel arm is equipped with a 5/8" thread into which a reducer with an inner thread of M10 is screwed. You can exchange this thread reducer for a commercially available reducer for microphone stands so you can mount the swivel arm onto a microphone stand. Depending on the design of the stand, the thread reducer for microphone stands have a 3/8" or a 1/2" inner thread that fit onto the thread bolts of the stands.

Exchange the provided 5/8" thread reducer with a standard thread reduce for stands **(A)**.

Screw the the thread reducer **(A)** onto the bolt of the stand by hand. Make sure the slit of the thread reducer is facing the stand.

Using a 19 mm jaw spanner, screw the retainer nut onto the bolts of the stand.

To ensure that the speaker does not loosen and cannot turn, you must screw the retainer nut tightly onto the knurled nut of the stand.



6. Proper Alignment of the Loudspeakers

Please note that precisely targeted speaker systems can significantly improve the acoustic result. It is not possible to make generalities about the alignment of specific systems because the room has a substantial influence on the signal and the audible result.

As a rule, the mid- and high-transducers of loudspeakers should be mounted above the audience's face value, so that the sound distribution cannot be shadowed.

In many cases it is advisable to mount a loudspeaker higher, so that the sound will be distributed throughout the room more evenly. Low standing systems result in a greater difference in volume between front and back seats than higher standing systems.

To simulate the correct alignment of the speakers beforehand, there are various programs such as 'Ease' or 'Ulysses'. The Kling & Freitag speaker system data is available for download on our website www.kling-freitag.de.

7. Operation with or without a controller

Important

Operation without a Controller

The SONA 5 system is designed so that it can be operated passively without a controller directly on a power amplifier. Follow the instructions in chapter "[Protecting the Speakers / Operating Safety]" beginning on page 7.

- For safe operation, they must only be operated with professional power amplifiers with a maximum rated output power of 200W@16Ω (equiv. 400W@8Ω or 800W@4Ω).
- If power amplifiers have power ratings lower than 100W@16Ohm, then it is imperative that the amplifiers have clipping limiters. Alternately, you can also insert a clipping limiter before the amplifier.
- To protect the loudspeaker from mechanical damage when high SPL is required a highpassfilter of 24dB/oct. at 60Hz has to be inserted into the signal chain.

Operation with a Controller

When operating the loudspeaker with amplifers without clipping limiter and nominal amplifier power less than 100W@8Ohm requires to set a Limit Reduction of 3dB for the K&F CD 44 controller. You can find more detailed information about this option in the K&F CD 44 hardware manual.

8. Wiring

Warning

Electrical current of loudspeaker signal may be hazardous for the human body.

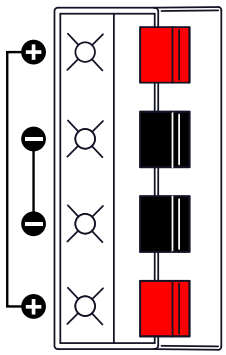
Always make sure the connectors secured against touch when the equipment is in use.

Always fully insert bared wire ends into the push connector or the Phoenix plug such that bared parts of wire can not be touched.

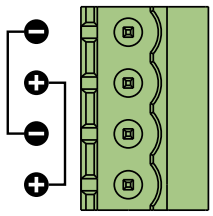
For speakers with Phoenix connector the bared wire ends have to be accurately screwed into the plugs.

8.1 Terminal assignment

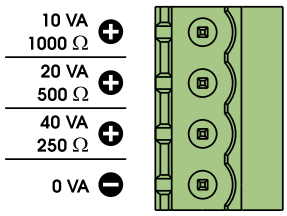
Clamp connector



Option 'Phoenix connectors'



Option '100 Volt' with Phoenix connectors



8.2 Wiring Diagrams

You will find all necessary pin diagrams for operations with the CD 44 Controller in the User's Manual of the CD 44! This applies for use with and without the K&F Subwoofer.

8.3 Wiring instructions

Important

- Before connecting your SONA 5 system switch off all equipment and turn down all level controls.
- Only use high-quality speaker cables with a sufficient wire gauge. The wire gauge depends on the length of the speaker cable.
  Minimum Wire Gauge (mm²)
  = Required Cable Length (m) / (2 x Speaker Impedance (Ω))
- For connections to the power amplifier inputs, please use 2-pin shielded microphone cable (balanced) with high-quality connectors.
- Avoid ground loops.
- Please pay attention to the pin assignments shown in this manual.
- Make sure that the +/- polarity of the speakers at the amplifier is correct. When simultaneously using power amplifiers from different manufacturers, be sure to use the correct specific pin configuration. It may be necessary to modify the pin configuration on the power amplifiers or on the connectors leading to them.
- Upon completing the wiring, ensure that the connected speaker channels are working in phase. To do so, use i.e. a phase checker. A phase error can also be recognized when the connected channels are used simultaneously. During simultaneous use the bass frequencies become notably quieter or the mid-frequencies such as voices cannot be located.
- If several loudspeakers are connected, the signal can be linked through from one loudspeaker to the next. Please make sure that the total impedance of the loudspeakers R(Ω) is not lower than the minimal impedance indicated on the power amplifier.
  1/R1 + 1/R2 + 1/R3 + ... = 1/Rtotal

9. Notes for the Version with '100 Volt' Option

Kling & Freitag speakers with '100V' option are fitted with high-quality transformers. This serves to minimize loss of sound. Highly professional sound reinforcement results can be achieved using '100 Volt' Kling & Freitag speakers.

Reasons for choosing Speakers with 100 Volt Transformers:

- Reduction in conduction loss.
- Easy installation of a loudspeaker network due to simple parallel wiring. The sum of the output power of the individual speakers (stated as VA = W) must not exceed the output power of the 100 Volt amplifier.
- Speakers are galvanically isolated.
- Speakers can be integrated into existing 100 Volt systems.

10. Operating the Speakers

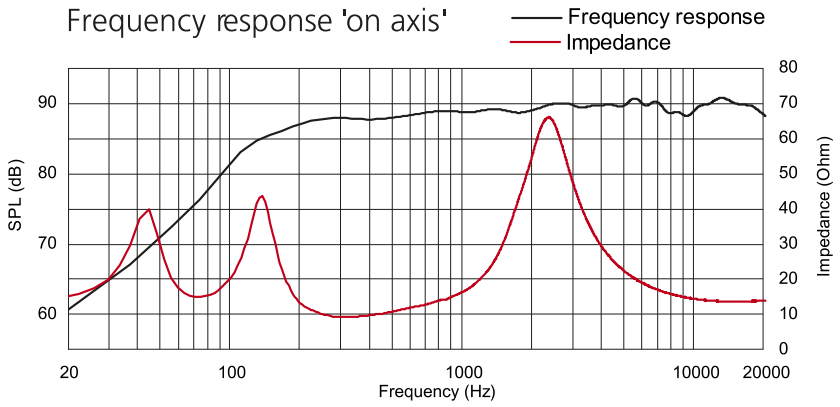
Important

- Switch off all equipment and turn down all level controls of the mixing console and the power amplifiers.
- Wire your systems according to the instructions in this manual. SONA 5
- Switch on the mixing console first, then the controller and the power amplifier. Always use the before mentioned switching order. Otherwise switching noises may damage the sound system.
- If there is interference, turn off all appliances in the reverse order and check all cable connections.
- Successively turn up the individual power amplifier channels and send a signal with low volume to the system. Check to see if the desired signals are applied to the intended speakers and make sure there is no interference.
  With controller: The SIGNAL LEDs of the CD 44 Controller will light up if the output level is higher than -45 dB. Your system should now be ready for operation.
- Turning down the input level controls may not always prevent distortions in the input section of the power amplifier, especially if this section has a relatively low headroom. A clipping signal may not be displayed by the clipping indicator then! To prevent signal interruptions or damages to the speakers, turn the level controls of the power amplifier to the maximum position, if possible. Set the output level of the mixing console or the controller to a level that doesn't overload the power amplifiers or decrease the limiter threshold of the controller.
- When turning off the system, the input controls for the power amplifiers should be turned down first followed by the power switches of the amplifiers. After that, the other appliances can be turned off.

11. Technical Specifications

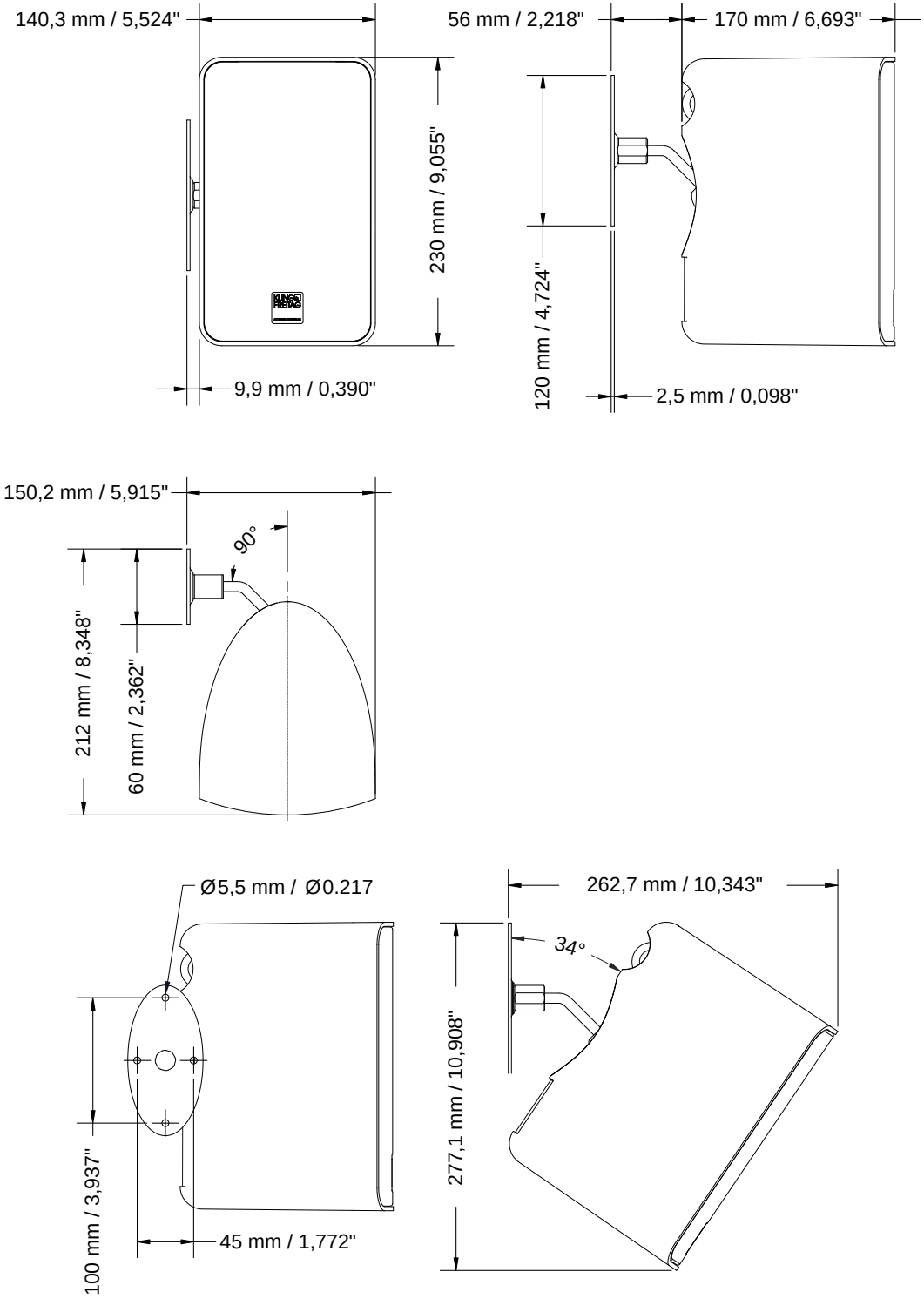
Design	Passive 2-way bassreflex system
Frequency range -10 dB	80 Hz - 23 kHz
Frequency range +/- 3 dB	110 Hz - 22 kHz
Coverage angles nominal	120° x 90° (hor. x vert.)
Power handling	100 watts (IEC 268-5)
SPL (1W / 1m)	89 dB SPL
Max. SPL (1m)	115 dB SPL
Components	5" low-mid chassis
	1" Dome tweeter plus waveguide
Impedance (nominal)	16 Ω
Connectors	Quad push connector (parallel)
Enclosure	high tech moulding synthetics
	(flame retardant class V0 according to UL94),
	safety eyelet for quick chain link,
	ball joint swivel arm with mounting plate,
	textured paint finish in black or white,
	exchangeable front grille
Dimensions	140 x 230 x 170 mm
Weight	2,8 kg
Options	'100 Volt' with 10/20/40 VA transformer
	and Phoenix connectors (3.4 kg),
	'Phoenix connectoers' instead of clamp connectors,
	'Special finish in RAL colours'
Accessories	5 mm quick chain link, certified,
	'Swivel arm S (32 mm)',
	'Swivel arm L (109 mm)'

12. Measuring diagrams

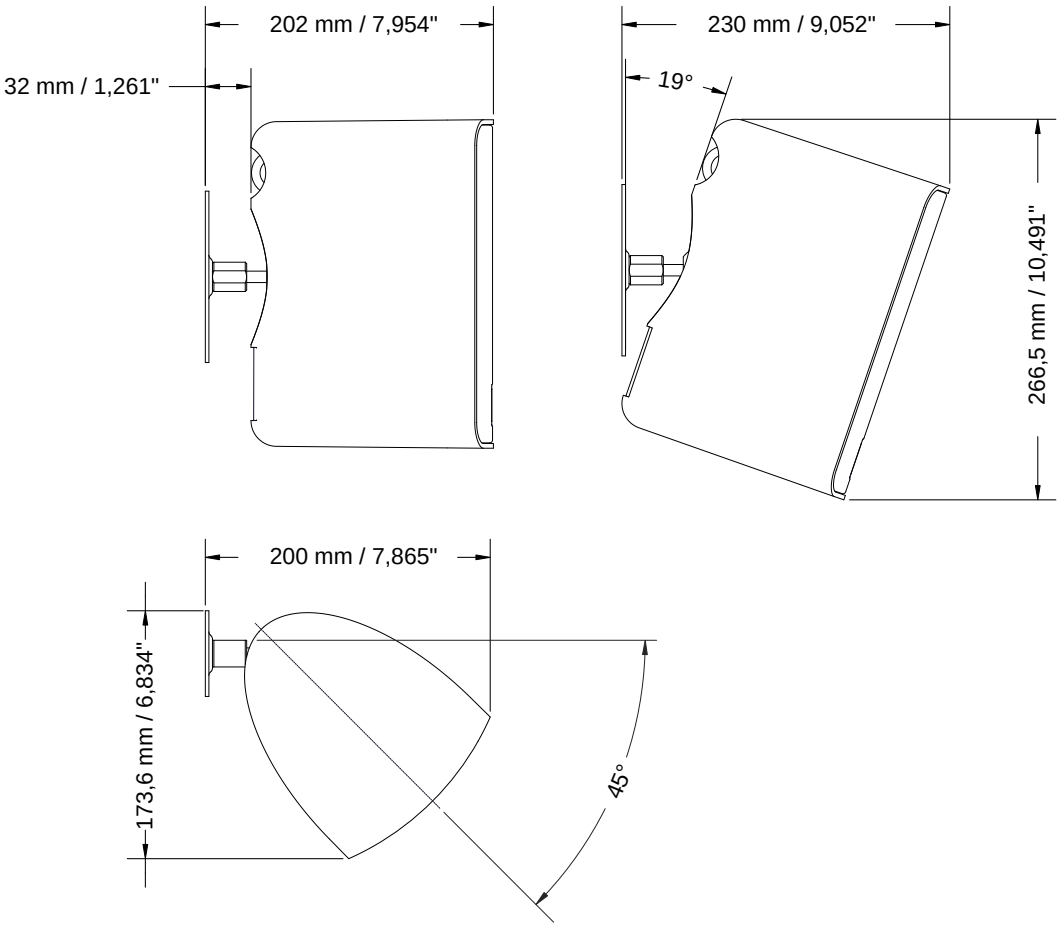


13. Dimensions

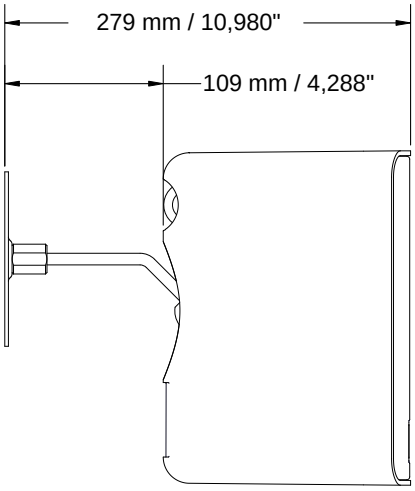
13.1 with swivel arm M (56mm) - (included)

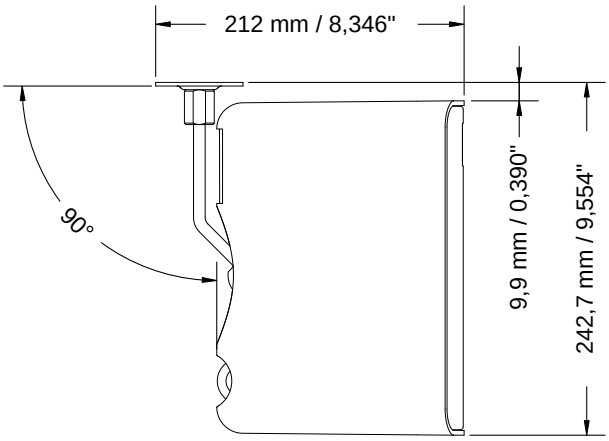


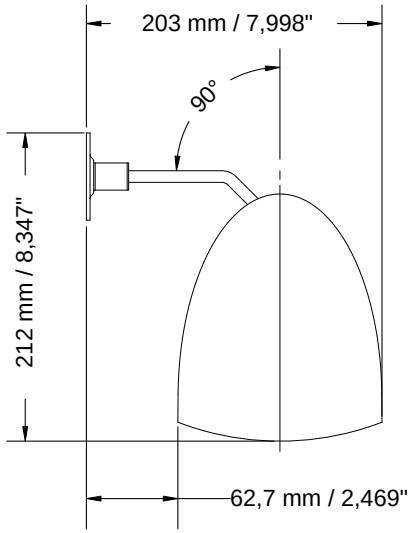
13.2 with swivel arm M (32mm) - (Accessory)



13.3 with swivel arm M (109mm) - (Accessory)







14. Disposal

14.1 Regulations for Disposal

14.1.1 Germany

It is not allowed to dispose of used electrical equipment as domestic waste.

Dispose of the SONA 5 loudspeaker at public collection points for recycling!

The SONA 5 loudspeaker is a so called dual-use product intended for domestic and commercial use. Therefore old SONA 5 loudspeakers can be disposed of in public collection/recycling points, contrary to Kling & Freitag products which are limited to commercial use. Of course old SONA 5 loudspeakers can be returned to us and KLING & FREITAG GmbH will take care of appropriate disposal.

Explanation

ElektroG is the enforcement of Directive 2002/95/EC, regulating, amonst others, the collection and recycling of electrical components and equipment.

From 03/24/2006 onwards KLING & FREITAG GmbH has thus labelled all products mentioned in the WEEE with a sign with a crossed out waste bin and a white bar below. This sign indicates that the disposal as domestic waste is prohibited and that the product has been put into circulation on 03/24/2006 at the earliest.

KLING & FREITAG GmbH has been legally registered as a manufacturer with the German registration office EAR. **Our WEEE registration number is: DE64110372.**

14.1.2 EU, Norway, Iceland, and Liechtenstein

It is not allowed to dispose of used electrical equipment as domestic waste.

From 08/13/2005 onwards KLING & FREITAG GmbH has thus labelled all products for EU-Member countries as well as Norway, Iceland and Liechtenstein (except Germany) mentioned in the WEEE with a sign with a crossed out waste bin and a white bar below. This sign indicates that the disposal on domestic waste is prohibited and that the product has been put into circulation on 08/13/2005 at the earliest.

Unfortunately the European directive WEEE has been complied with implementing different national provisions of law throughout all member countries, which makes it impossible for us to offer consistent solutions for the disposal throughout Europe.

Responsible for complying with these provisions of law is the local distributor (importer) of each country.

For proper disposal of used products in accordance with these local provisions in the mentioned countries of the European Union (except Germany) please ask your local dealer or the local authorities.

14.1.3 All other Countries

For proper disposal of used products in accordance with local provisions in other than the above mentioned countries please ask your local dealer or the local authorities.